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ABSTRACT

An 8-year-old hospitalized severely autistic boy was given up to 8 hours per day of therapy for 5 months in an attempt to establish a strong child-therapist affection relationship (which would serve as the basis for all other therapy) and to train the child through a behavior modification program. The teacher-therapist was a graduate student supervised by a hospital psychiatrist. Tommy's symptoms included inability to relate to people, self-imposed isolation, lack of reaction to auditory stimuli, lack of speech, hyperactivity, repetitious motions, feeding problems, and lack of toilet training and ability to dress himself. The first month of therapy was devoted to establishing physical contact and affection. Next, a behavior modification program was gradually introduced to teach personal, social, and academic skills. As a result of the one-to-one therapy, Tommy learned to speak about 70 words, became toilet trained, dressed himself, ate using utensils, learned to read and write numbers to 10 and about 20 words, improved his social skills, decreased his self-isolation need, and lengthened his attention span. Emotional weaning (therapist's gradual withdrawal out of relationship) ended the therapy. A five-page bibliography concludes the document. (KW)

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TOMMY:
A Treatment Study of An Autistic Child

Uwe Stuecher, Ph.D.
Assistant Professor
Department of Special Education
University of Minnesota

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U.S.

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INTRODUCTION

Autism is a fearsome affliction. It has baffled scholars, scientists, and practical men since long before a name was given to this confusing array of behaviors. Only two major areas of agreement seem to exist among the experts. First, most agree that a fundamental condition of infantile autism is the inability of the child since infancy to relate to others in anything like ordinary human interactions. Second, most agree that the course of the problem is greatly affected by the type of education the child receives at the hands of parents and other significant adults.

In all other respects, there is much disagreement and confusion, not even a name for the affliction has general agreement. The most common names for this peculiar and confusing group of behaviors include autism, early infantile autism, childhood schizophrenia, and schizophrenic syndrome in childhood. For a variety of reasons, including the differentiability of childhood schizophrenia and autism based on certain important characteristics described most cogently by Rimland (1964), this discourse will consider autism and early infantile autism as one and the same but as different from childhood schizophrenia and related terms.

Neither the etiology, the nature or description of the problem, nor the treatment is clear to this day. Nor is it clear that autism is all of a piece; some argue that there are multiple routes to the condition, multiple descriptions, and multiple treatments equally lacking in success.

Leo Kanner, a noted child psychiatrist, was the first to describe symptoms of early infantile autism which he sharply differentiated from childhood schizophrenia, arguing that autistic children showed certain characteristic behaviors from birth, whereas schizophrenic children showed at least 2 years of normal developmental behaviors. The central element of Kanner's symptoms was aloneness and inability to relate to

others, with certain obsessive behaviors (such as rocking, spinning, making noises) and peculiarities of speech also being present. In primary school years the autistic child was described by Kanner as maintaining his aloofness, as possibly learning limited language skills although showing great difficulty with abstract language and ideas, and as sometimes showing excellent rote memory (Kanner, 1943, 1944).

As with all mental or behavioral disorders, the descriptive characteristics of autism frequently appear in normal children; the critical factor is the degree to which they are present. In the autistic child they are extremely severe indeed. Another of the problems presented by the autistic child is that often he will show isolated areas of behavior that do not fit his predominant pattern of retarded or negatively peculiar development, as, for example, the 3 year old child who can read (pronounce) nearly any English printed word placed before him but who understands little that is spoken and nothing printed.

Among the many sets of behaviors various clinicians and researchers have compiled to describe autism, Rimland's 1964 list, which overlaps greatly with Kanner's, is quite descriptive. Included are "autistic aloneness" characterized by staring into space and lack of reaction to sounds, total disinterest in people, serious difficulty in toilet training, serious feeding problems, repetitive behaviors, early skill in isolated areas (e.g., musical skill), lack of social intelligence, and, among those who can speak, meaningless echoing of words spoken by others. The behaviors of the child with early infantile autism are typically seen by the parent and casual observer as being extremely unusual in any normal developmental sense and by the clinician as being quite bizarre. Ordinarily the observer knows that this is an unusual child, but because of the peculiar combination of symptoms it is often difficult to be clear as to the specific problem and treatment.

As with most other aspects of autism, beliefs about its causes find little agreement among the experts. While most recognize that autism is a phenomenon involving many different factors, limited evidence exists for the importance of the components thought to be involved, the interaction among these components is not well understood and the weight given them is a subject of much disagreement. The major beliefs about the etiology of autism are that it is: (a) genetic, due to

inherited defects (a position represented by Kallmann, 1952, and Bender, 1955); (b) constitutional, a prenatal or perinatal predisposition not necessarily due to heredity (a position supported by Mahler, 1952, and Rimland, 1964); (c) psychogenic, coming from serious untoward psychological influences in the child's early environment, often oversimplified as "blaming the parents" (a position supported particularly by Szurek, 1956, and to some extent by Kanner, 1949, and Bettelheim, 1956); and (d) multiple combinations of the above factors and possibly still others as yet unidentified. Very likely most experts can be interpreted to support this last position, but Sarvis and Garcia (1961) can rather clearly be cited here, as can Kanner (1965).

Finally, the lack of any generally effective treatment of choice for the developmental, interpersonal, or educational problems of autistic children has been a major weakness for many years. Psychoanalytic treatments extending over periods of years and shorter term psychotherapies of various types for the child and his parents have been applied with limited success. Drug therapy and electro-shock have had similarly inconclusive but probably even less promising results. However, the relatively recent application of behavior modification techniques with autistic children has produced enough success to be encouraging (Wolf, 1964; Hewett, 1965; Metz, 1965; Lovaas, 1967). A common weakness in the results of operant conditioning procedures has been the inability to teach social skills (personal relationships) to autistic children. Since autistic aloneness and the absence of interpersonal skills is a central characteristic of childhood autism, that deficiency in a treatment becomes of major importance. By contrast, the major strength of psychotherapeutic treatments is in the relationship between the child and his therapist. Thus, a melding of the two treatments would promise the possibility of better results than either could produce alone, providing of course that they were skillfully applied.

The author of this monograph, Mr. Uwe Stuecher, the teacher-therapist whose work is described therein, is an unusual man. He is able to effectively combine psychotherapeutic skills and conditioning techniques, but it may be that the success of his treatment is due as much to his unique characteristics as to the methods themselves. Certainly some part of his

success must attach to his personal characteristics. He frequently worked 8 hours daily, 7 days a week, with infinite warmth, regard, and affection for the child—but with much more than love since expectations constantly extending the child's level of tolerance and skill were always there. Such behavior is not possible from every teacher-therapist. While others can certainly learn the techniques, their paler imitations over time will provide enlightenment regarding the proportions of scientific technique and personal style necessary to be effective. It is probably accepted without dissent that a Prince Myshkin (the gentle soul who loved and communicated well with children in Dostoyevsky's *The Idiot*) is far better than a M'Choakumchild (the horrendous rote memorizing master in Dickens' *Hard Times*), but the precise blend of art and science continues to be a serious question in teaching. The blending of Freudian clinical attitudes and procedures with the techniques of stimulus response theory into an effective psychoeducational method is clearly detailed in this monograph.

Some understanding of the man himself may be gained from knowing events that led to this monograph. Mr. Stuecher was educated in Germany, his country of birth, before coming to the United States for graduate work in the education of disturbed children. One of his field placements during the course of his degree program was in a children's psychiatric hospital at a university. There he quickly selected for his major efforts the one child most profoundly disturbed and most ignored by the staff. Judged by competent medical and psychological diagnosticians to be brain damaged and severely mentally retarded, to have autistic features, and to be incapable of advancement in any behavioral sphere, Tommy was quite clearly not the ideal candidate for educational intervention. Few professionals in any of the behavioral sciences would purposely select such a child since all of the known predictors shout out—Danger! No passage! Uncharted swamps! But Mr. Stuecher went to work to map out the territory and to construct his own road.

To compound the problem, early successes were not universally acclaimed by all involved. Opposition quickly arose and road blocks of a variety of types came from other professionals whom the objective observer might have expected to be overjoyed at the progress to be seen in a child previously consigned to the human ashheap. But human nature, flawed as

it is by all too human weaknesses, finds it hard to be glad of being proven wrong even when the outcome for another person is so magnificent. Some of the opposition created serious problems for continuation of the treatment but, fortunately and predictably, Mr. Stuecher persevered.

This monograph demonstrates well and truly the combination of art and science in teaching at its best. The wise application of psychology and pedagogy by an individual of great intelligence and sensitivity may be readily seen. The reader will note the powers of observation, analysis, and thought which led to program plans and exercises. When successful, exercises were continued with constant adjustment, replanning, and new steps introduced according to the child's behavior but following established principles of learning. When a carefully developed plan was unsuccessful, as in the first attempt to teach Tommy to speak, Mr. Stuecher was quite ready to back off, to restudy the problem, and then to return with a new approach which was extremely creative and, as it happened, highly successful.

This is an excellent illustration of progress occurring when the best talents of an outstanding teacher are applied and when the teacher has the good sense to change an unsuccessful approach rather than simply expect the child to make adjustments to the program.

Throughout the progress of the work one can see the blend of pedagogic and psychotherapeutic skills establishing a framework and teaching style within which behavior modification is judiciously applied as an important tool. It may be presumed that alone, neither the most skillful mechanical application of conditioning processes, the pedagogy, nor the most sensitive psychotherapeutic interactions could have produced the results obtained. Nor is it likely that the combined method would have been as effective in every teacher's or therapist's hands. In the final analysis, the successful resurrection of Tommy is a living tribute to an unusual man.

Bruce Balow
Director, Division of Training Programs
Bureau of Education for the Handicapped
U.S. Office of Education

BACKGROUND

TOMMY'S HISTORY

At the beginning of treatment, Tommy (not his real name) was 8 years, 2 months old, the product of a full term, uncomplicated pregnancy. He is the fifth of seven children ranging in age from 16 to 4; all of them are boys except for the second child, a 14 year old girl. His birth weight was 8 pounds, 7 ounces and there were no recorded illnesses in the neonatal period.

Development

Tommy smiled and cooed at approximately 1 to 2 months, sat up at 5 to 6 months, and walked at 9 to 10 months. At some time past 1 year of age, Tommy spoke a few words and toward the end of the second year had a vocabulary of approximately 10 words. At about this time, Tommy began to regress. He gave up speaking and his mother describes him as being depressed and withdrawn. Prior to admission, he had not spoken since that time—more than a 5 year span. The mother believes that this withdrawal coincided with the birth of his next youngest sibling. When he was 1, he had an illness that was presumed to be measles. It is the feeling of the family, however, that there is no correlation between that and Tommy's regression.

Family History

The father is a farmer and in good health. While the mother's physical health is apparently good, she has had psychiatric problems which have necessitated her being hospitalized on more than one occasion in the past. There is no family history of tuberculosis, diabetes, mental retardation, or seizure disorders.

Tommy's Medical History

There is no history of seizures, allergies, trauma, or significant illness other than the measles. The physical

test, taken after admission to the hospital, was essentially within normal limits. Tommy was not able to cooperate during the physical examination so that sensory examination and hearing tests could not be done. A later hearing test revealed that Tommy's hearing is probably normal. An EEG was performed and was reported as mildly abnormal due to asymmetry and occasional asynchrony of sleep spindles. In summary, Tommy can be regarded as a physically healthy child. He has a well built physiognomy and handsome appearance.

Psychological Testing

Several attempts at psychological testing failed at first because of Tommy's uncooperativeness. After 2 months' hospitalization, the Merrill-Palmer Scale of Mental Tests, designed for nonverbal children, was administered. Tommy passed all the items which he attempted on the 66-71 month level. He consistently refused to work with the blocks, the buttons, the manikin (a wooden puzzle), and a matching task. While he successfully completed the three puzzles and the mare and foal, he seemed to be relying on the shape of the pieces rather than their content. In summary, Tommy was operating at about the 5½ to 6 year old level on tasks requiring perceptual-gross motor coordination, and at about the 5 year level on those tasks requiring fine motor coordination. The final evaluation by a clinical psychologist before treatment began: "Prognosis is poor, regardless of the type of treatment and final disposition of this case." The following was the diagnosis made by the psychiatrist before the beginning of treatment: "Chronic brain damage with autistic features." Soon after this, Tommy was to be dismissed and put in a mental institution.

Setting

The treatment took place in a large hospital with a well equipped child psychiatric station. The station functioned primarily as a diagnostic center with long term treatments allowed only as an exception. The teacher-therapist was a 28 year old male graduate student supervised by a hospital psychiatrist. The child was an in-patient and under 24 hour supervision by the ward personnel. Initially, the treatment took place in

Tommy's room; later, it was carried out on the station's playroof, an inside playroom, and a separate classroom.

INITIAL STATUS AND BEHAVIOR

The teacher-therapist began work with Tommy 2 weeks before the psychological testing was performed, i.e. shortly before the planned discharge of the child. Because of the improvements noted in Tommy's behavior, therapy was allowed to continue for 5 months.

Behavior Observed by Nurses

When Tommy was first admitted he was nonverbal, would not dress himself, ate with his fingers, was not toilet trained, and would frantically flee any attempt of social contact with children or staff. He seemed constantly worried, sad, and panicky. At mealtimes he would lie down on the dining room floor, refusing to eat. At night he showed a very nervous sleep. He displayed many unusual kinds of behavior such as constantly spinning objects, throwing objects and hopping after them screeching gleefully, constantly spinning himself, and seeking isolation. Tommy would meticulously tear bits of paper into geometric shapes, wet them with saliva, and tack them in exacting designs onto the wall. Initially he would eat only milk and bread, refusing any other food. He showed no signs of warmth and refused any kind of personal contact, seeking the staff when he wanted something.

Tommy refused to follow simple commands but responded to his name at times. He defecated and urinated in his room, at times holding his urine or stool for long periods of time without passing it anywhere else on the ward. If the door to his room was locked, he would hold urine the entire day and void in the shower at bedtime. He would sometimes refuse to defecate for up to three days at a time. Using the first occasion, he would sneak into his room, urinate against the radiator, and defecate on the floor. He was observed enjoying smelling and handling his feces. Tommy spent most of the time retreated in his room, lying rigidly on his bed with his arms stretched out stiffly by his side. Any form of disciplinary method failed totally; in fact, slapping his hand eventually became "a game" for him and the stimulation seemed to become a reward instead of a

punishment. Tommy appeared to be compulsive and ritualistic and reacted strongly to changes in his environment.

BEHAVIOR OBSERVED BY THE THERAPIST—FIRST DAY OF TREATMENT

When the therapist entered the room, Tommy was lying on his bed and rolling his head from one side to the other. He did this for 15 minutes in succession. He then jumped up and spun a wooden toy, while excitedly jumping up and down and showing signs of hyperactive behavior. Afterwards, he lay on the bed again, rolling his head, then suddenly jumped up and started spinning himself for about 1 minute, resting a while, spinning again and repeating this procedure for approximately 10 minutes. He then lay on the bed again. He did not show awareness of the presence of the therapist and avoided all eye contact. When he accidentally came very close to the therapist during his games, he did not show any reaction, but rather appeared to look through the visitor, completely ignoring his presence. This behavior pattern was shown by Tommy for 3 hours on the first day of observation. When the therapist came closer to Tommy as he lay on his bed and bent over him to look into his eyes, Tommy became physically stiff and rolled his eyeballs so far back that only the white of his eyes could be seen. Three such attempts by the therapist on the first day were reacted to in this manner.

Tommy's Most Severe Symptoms

As observed by the nurses and therapist, Tommy's most severe symptoms were:

1. Inability to relate himself in a normal manner to people and situations;
2. Extreme autistic aloneness—insistence on self imposed isolation and lack of reaction to auditory stimuli;
3. Total disinterest in people (beginning at age 2);
4. Compulsive need for sameness in the physical environment, strong reaction to change;
5. No toilet training;
6. Inability to dress himself and enjoyment in taking off clothes;

7. Feeding problems—very picky in choice of foods and wolfish way of eating;
8. Repetitious, monotonous motions—spinning himself and objects, head rolling, reposing in stiff manner;
9. No speech at all—production of some high pitched "eee" screeches;
10. Lack of social intelligence, empathy, and warmth;
11. Hyperactive behavior.

TREATMENT

PROCEDURE

The entire therapy lasted about 500 hours on a one-to-one basis spread out over a 5 month period. In the first month, therapy sessions were held 6 days a week, and from then on, 7 days a week, up to 8 hours a day. Each therapy session began at the same time in the morning. The following goals were set for the therapy:

1. *Establishment of a strong affection relationship between child and therapist.* This relationship was the planned basis for all other therapeutic techniques, manipulations of learning contingencies, and the entire treatment in general.
2. *Establishment of a behavior modification program to train the child.* The following specific areas were chosen: (a) self dressing, (b) eating habits, (c) toilet training, (d) speech, (e) fine motor skills (f) academic skills, (g) social skills.
3. *Gradual withdrawal out of relationship*, emotional weaning.

The most important part of the treatment concept was to *first* fulfill the child's *needs*, whatever they might be, and *then* make increasing *demands* on the child, but always according to the child's tolerance level. Practically, this meant not superimposing an operant conditioning program on the child, but using operant conditioning tools with the consent of the child, according to his tolerance level, as a means of communication and in some respects, as a game. Administering of punishment or aversive stimuli were not used by the therapist.

ESTABLISHMENT OF RELATIONSHIP

The establishment of a relationship means, in a sense, the establishment of communication. The therapist tried to establish some kind of communication system through which messages could be exchanged.

Step 1 (1st and 2nd week)

Therapist carefully brought himself physically closer to Tommy, disregarding his isolation strategies, but never threatening him through sudden embracing, with which Tommy would not have been able to deal. This aspect was accomplished in 2 weeks.

First week. The therapist stayed in the patient's room for 4 straight hours, sitting on his bed and moving closer. If Tommy showed anxiety, the therapist moved back until tolerance level was reached, then after a while moved closer again. No verbal stimulation was given by the therapist.

Second week. Tommy tried to escape the therapist's presence and crawled under his bed; therapist followed and spent this week with Tommy under his bed, following the basic approach of the first week. After 3 days, Tommy tolerated the therapist touching his foot, and later his hand. Holding hands was established. This proved to be a communication device of major importance because many things can be and were communicated through touching hands. Very little verbal stimulation was given by the therapist.

Step 2 (3rd week)

In a sudden move, Tommy clung to the therapist's back, pressed his head against the therapist's shoulders, and screeched his typical "eee" sound. From then on, Tommy wanted to be carried on the therapist's back. "Carrying patient on back" became part of the daily activity. The rest of the week was spent carrying Tommy out of his room to the play deck, where "horse and rider" was played up to 5 hours a day.

Step 3 (4th week)

Therapist began patting Tommy's head and back and Tommy started sitting on the therapist's lap, pressing his head on the therapist's chest. Hugging, patting, accompanied by soft spoken words from the therapist, and carrying on back were 100 percent of the activities for several more days.

Step 4 (5th week)

Eye movement exercises were begun at this step. Therapist would point at something and carefully guide

Tommy's head in that direction. Body image exercises were also begun at this time. Therapist would touch parts of Tommy's body, naming them. Child's hands were taken and placed upon therapist's head, eyes, arms, etc. Initially Tommy showed a strong resistance to having to look at his body parts, such as hands, and showed much anxiety. The following example demonstrates these difficulties quite well. After Tommy gradually tolerated more and longer body image training (at about 7 weeks) the therapist planned on working on the face, i.e., touching nose, lips, eyes, etc. A mirror was brought into the classroom, but Tommy could not tolerate looking into the mirror and showed high anxiety behavior such as crying. He reacted similarly, but not quite as strongly, to a photograph of himself, but finally accepted mirroring himself in a large bowl of water with a light shining from above. Both therapist and patient looked into the bowl, touched each other's noses and Tommy became quite interested in this game. After another week, he accepted the photograph and finally the mirror, which remained an important tool for body image exercises.

BEHAVIOR MODIFICATION PROGRAM

The second phase of therapy began during the second month. In order to establish a behavior modification program, a survey of Tommy's food preferences was made and new cereals and cookies were given to him on a trial basis in order to find a good and practicable food reinforcer. Milk and "frosty flakes" were found to be the best reinforcers, Tommy particularly favoring milk. Tommy was deprived of half of his usual breakfast right before the therapy sessions began.

Step 1 (5th week)

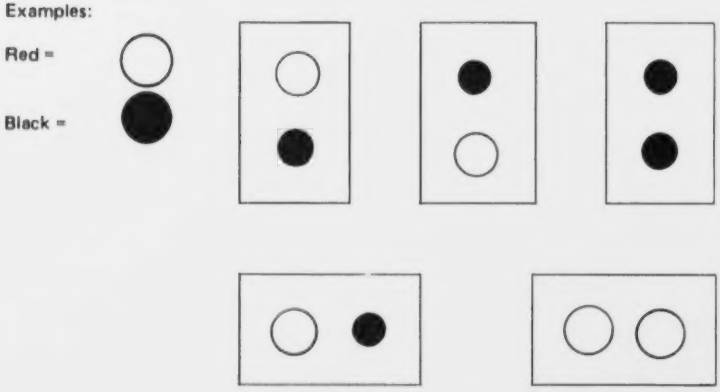
Therapist carried Tommy into the new classroom, sat him on his lap, and started with body image exercises for about 5 minutes. He was then given milk and frosty flakes, followed by 3 hours of the usual "horseback" riding on the play deck. The beginning ratio of work time to play time was 3:97 (5 minutes work to 2 hours 55 minutes of play). It was then increased to 6:94 (10 minutes to 2 hours 50 minutes) during the next days at which time the next step was introduced.

Step 2 (5th week)

Therapist sat Tommy on a chair while holding his hand. On the desk in front of Tommy were sheets of cardboard on which he was asked to paste, with his free hand, a circle. Tommy was at first reinforced with a little bit of milk in a cup for sitting down, then for touching the material, and finally for pasting a circle on the cardboard. Prompting techniques were used often during the first three sessions. During this phase, the work-play ratio was 9:91, or approximately 15 minutes work versus 2 hours 45 minutes play.

Step 3 (6th week)

Tommy began working with both his hands, although once in a while grabbing therapist's hand for a few seconds before continuing. The therapist now sat on Tommy's right side, seated a little behind him and with one hand on his back at all times. The pasting work became more complex: Tommy had in front of him small boxes of different colored and shaped cut-outs. He would be shown a model, or cue card, and be requested to match it.



cue cards used for matching by size and color

The work-play ratio had been increased within 6 days to 12:88 or 20 minutes work to 2 hours 40 minutes play.

At about this time, 6 weeks after beginning of therapy, the programs for self dressing and eating habits

were developed. The nurses and other ward personnel were informed about some basic concepts of behavior modification, and the following procedures were worked out.

Step 4 (7th-11th week)

For the self dressing programs, the nurse who woke Tommy up entered the room with a carton of milk and a cup. By using successive approximation, self dressing was to be established, with initial prompting facilitating the process. Tommy was first rewarded with a sip of milk for touching his clothes. Then he received reinforcement for his cooperation in each of the following steps:

1. Taking off night dress;
2. Touching his clothes;
3. Putting on underpants;
4. Putting on undershirt;
5. Putting on and buttoning his shirt;
6. Putting on and buttoning his pants;
7. Putting on his socks;
8. Putting on his shoes;
9. Tying his shoes.

Totally independent dressing habits were to be created as more and more fading out of the nurse's help (without upsetting Tommy) was implemented. This procedure took place for about 1 month.

Step 5 (7th-9th week)

To improve Tommy's eating habits, the milk on the dining table was withheld until he used a fork and spoon. He was initially reinforced for holding a spoon in his right hand, even while eating with the fingers of the left hand. Tommy later pushed food with the left hand onto a spoon and ate from the spoon. This procedure took place for about 2 weeks.

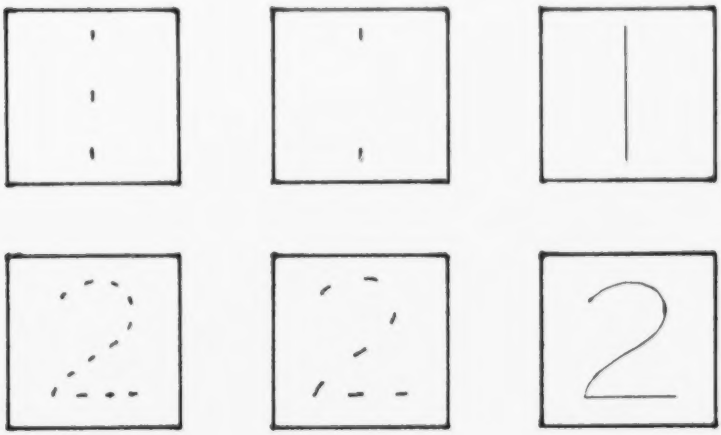
Step 6 (7th-8th week)

At the same time that self dressing and eating habits training was taking place with the nurses, the therapy switched to a different program to establish better eye-hand coordination. The Frostig tracing material was

used for this purpose. The material gradually leads from tracing simple lines to tracing circles and more complicated lines, which leads to better hand control. It can be regarded as a prewriting exercise. Tommy was reinforced with milk after completion of tracing one figure. Later, tracing of the Montessori form patterns was added to the program, essentially the same kind of exercise as the Frostig material. This program lasted about 10 days. By this time, the work-play ratio had increased to 25:75, or about 45 minutes of work to 2 hours 15 minutes of play.

Step 7 (8th and 9th weeks)

The program was changed to writing numbers, beginning with numbers 1 and 2, later adding number 3. To facilitate the transition from the tracing material to writing numbers, instructional material was designed:



transitional material—from tracing to writing

Tommy first had to connect the dots; the next step was to trace the faint line visible from the number drawn on the reverse side. All the numbers, with the exception of number 1, were 2 inches high at the beginning and later reduced to 1 inch high. In the beginning, Tommy needed much prompting. The therapist first held his hand and drew the number with his

finger. Next he placed a pencil in Tommy's hand and guided his hand over the number. Finally, the therapist would hold Tommy's hand, but Tommy had to move the pencil more and more independently. Food reinforcement was administered after the completion of each number. The exercises on numbers 1, 2, and 3 lasted about 10 days. The work-play ratio improved during this time from 33:67 (1 hour work to 2 hours play) to 38:62 (70 minutes work to 1 hour 50 minutes play).

After approximately 10 weeks of therapy, two new steps were added to the program, speech training Phase I and toilet training.

Step 8 (9th-10th week)

Phase I of speech training was begun during the ninth week. Tommy was still nonverbal, but the quantity of his sound output had increased considerably since the beginning of therapy. This sound output was confined to the play sessions (during working time he remained silent) when he would emit the earlier described high pitched "eee" sounds, especially while playing "horseback." It was noticed, however, that the sounds were becoming somewhat more melodic and the impression was given that other sounds besides the known "eee" sound were being emitted. An inventory was therefore made of Tommy's sound repertoire over a period of 4 consecutive days during the play period. The therapist carried a tape recorder with him and recorded each day an hour of "horse and rider" playtime. The findings of the investigation are listed below.

The first and second lines on the following scales represent a tone pitch which is used in common speech. Everything above these lines is not used in common conversational language. The sounds in quotation marks represent phonetic symbols.

1. "clearing the throat" sound

2. "iaei"—very clear "a":

3. squeaked "i"

4. "i":—"to be"

5. "e"—"bed"

6. "u":—"boots"

7. "ui"

8. "io:"—"horse," "i" squeaked

9. "nya"—"n"
10. "ke" or "ki"—"k"
11. "ae"—"mad"
12. nasal sound—"England"
13. "g"—"give"
14. When Tommy gets unhappy he makes a baby-like grunting sound as if defecating.

Order of frequency of emittance was as follows:

Vowels:	1. a,e,i	Quite often
	2. ae (mad)	Seldom
	3. c,u	Very seldom
Consonants:	(in general much less frequent than vowels)	
	1. y in connection with a,e,i "ya"	Relatively often
	2. m,n	Seldom
	3. g,k	Very seldom
	4. d	Only one emittance known known

The speech training program Phase I was designed as four separate steps:

1. Tommy was to be rewarded for all vocalizations in the classroom, until a number of vocalizations were frequently emitted.
2. The therapist would emit a sound within Tommy's repertoire; Tommy was to be rewarded only if he vocalized within a short period (about 5 seconds) after the therapist's cue.
3. When Tommy's vocalizations within the 5 second interval increased to the extent that he would "answer" about all of the therapist's cues, he was

then only to be rewarded if he could match, in successive approximations, the therapist's vocalization.

4. Finally a whole word had to be matched by Tommy in order to receive a reward.

This program was discontinued after approximately 2 weeks because of Tommy's lack of cooperation. Further speech training was resumed later (see Step 13).

Step 9 (10th-22nd week)

The toilet training program was begun by defining a successful "toilet going" process for urinating and defecating. The act was divided into seven phases:

1. Opening the bathroom door, entering the room, and going to a toilet bowl;
2. Pulling down trousers and sitting down on toilet seat;
3. Urinating or defecating (or both);
4. Wiping self; flushing toilet;
5. Getting up from seat and pulling up pants;
6. Washing and drying hands;
7. Opening door and leaving bathroom.

It was observed that Tommy had difficulties with all seven steps. Furthermore, the following rules were set up: Tommy was to receive his food three times daily at exactly the same time. At the following hours, the nurse in charge was to go with Tommy to the bathroom (or later, tell him to go himself):

6:45 A.M.—waking up time
8:00 A.M.—directly after breakfast
12:00 Noon—directly after lunch
5:00 P.M.—directly after supper
9:00 P.M.—before going to bed

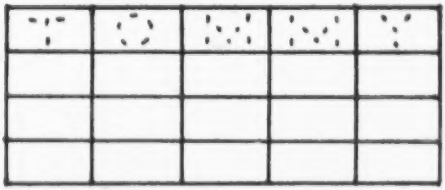
It proved to be difficult to control phase three, successful urination or defecation, if the nurse was not in the bathroom with Tommy (she had to leave the toilet as part of the later program in order to let patient become independent in his toilet behavior). The nurse stood outside the door and if no other sounds indicated successful action, the flushing was accepted as the indicator of success. At the beginning of the program, each phase was to be reinforced with little pieces of Oreo cookies, substituted for the usual milk reinforcer,

which proved to be inconvenient in this case. The reinforcement was given only upon total fulfillment of the seven phase toilet act. The total toilet training program lasted about 12 weeks. The nurses on the ward were in charge of executing this step, but the program was supervised by the therapist.

Step 10 (10th week)

In the tenth week of therapy, the school program was further broadened by the start of a program in the shaping of writing skills. Exercises in form and picture matching were used, and when Tommy was able to match simple and more complex forms, he was asked to pick the appropriate card out of a pile and match it with one of the cards in front of him. Initially when this matching program was started, Tommy could not match pictures by laying them on top of each other because of his hyperactivity. It seemed as though his mind could not attack the problem as long as his hands were not occupied. The therapist remedied this by pasting one set of pictures on a board and having Tommy nail with a hammer the corresponding picture onto the board. Using this technique, Tommy's matching ability instantly improved and he was able to match even very complex pictures requiring high discrimination.

Next the writing of words was added to the academic training. The therapist first printed the dotted word



beginning words

letter by letter on such a sheet, and then Tommy copied each letter on his own sheet by connecting the dots. The next step was copying the letters without any cues and thereby learning the letters. After Tommy had learned to write his name, the writing lesson was structured in

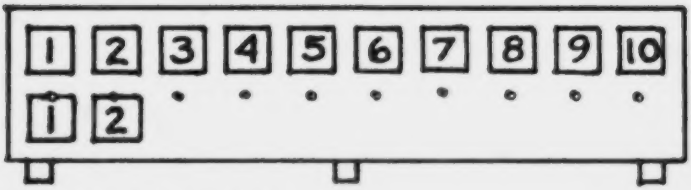
the following way: The therapist presented Tommy with a picture card from the Peabody set, e.g., a dog. Tommy had to touch the picture and then copy the word "dog" on a prepared sheet of paper. This was later expanded to the sentence, "This is a dog."

During this period of learning, a typical session would be as follows: Tommy would sit on a chair next to the station's front door and wait for the therapist to come (this behavior began in the sixth week of therapy). When the therapist arrived, Tommy took his hand and they went together into the classroom. The therapist sat down, with Tommy in his lap, and they would hug each other and do body image exercises for about 10 minutes. Then they would work on numbers for about 45 minutes, ending with a 15 minute break which was spent with body image exercises, physical closeness, hugging, fondling, patting, carrying in arms, etc. Sometimes Tommy would want to take a break during the work period, and this he was allowed to do. Frequently he would drop his pencil, sit on the therapist's lap for several minutes and then go back to work by himself. After the planned 15 minute break, Tommy and therapist would work on writing exercises for another 45 minutes. Then Tommy would be taken to the play deck and would play with the therapist for 30 minutes, most often "horse and rider" or being pulled around in a small car. At the end of this period, Tommy would go wash his hands and get ready for his lunch. The work-play ratio by now had increased to approximately 75:15, 135 minutes work to 45 minutes play. Food reinforcers—milk and cookies—were still used for quite some time, but they seemed to become increasingly less important and social approval began slowly to take their place.

Step 11 (13th week)

After Tommy had learned to write the numbers 1 through 5, the number concept training was started. The therapist designed a board with numbers 1 through 10 glued on in the form of cards and underneath each card was a nail.

The therapist would show a card to Tommy (the same size and type as those glued to the board) with a number on it. The cards had a punch hole so that they



the number board for matching

could be placed on the nails. Tommy was asked first to copy the number on a piece of paper, and then place the card underneath the corresponding number on the board, i.e., he was asked to match the numbers. At the beginning, Tommy did not respond to the visual cue of the number card. The technique was then developed where Tommy would place his hand in that of the therapist and the therapist would squeeze Tommy's hand the correct amount of times, e.g., two short squeezes for the number 2. After Tommy became proficient in matching, a pegboard, counting board, and domino stones were added. Then the therapist spread the number cards in front of Tommy and asked him to: (a) find a specific number (if Tommy did not react, therapist would squeeze the answer in his hand); (b) match the number of the board; (c) write the number on a piece of paper; and (d) put the correct amount of pegs in the board.

Later the number cards were replaced by cards depicting a certain number of stars, triangles, squares, etc.

matching shapes

The procedure during the later stages of number concept learning consisted of the following steps:

1. Writing down specified number (for example, number 3);
2. Finding the figure card with the correct number of figures on it (for this step all cards of one set, e.g. triangles, were placed in front of Tommy);
3. Matching the figure card with the correct number card on the board;
4. Putting three pegs in the pegboard;
5. Checking answer by counting the number of pegs with finger and counting number of triangles on the figure card hanging on the board;
6. Taking three domino stones out of the box and placing them in therapist's hand.

At first Tommy was rewarded with food after each step, later only upon completion of all six steps.

Step 12 (11th week)

Since Tommy had not yet begun to verbalize, the therapist attempted to establish some means of a preverbal communication system, which could be understood by outsiders and which would also be more socially acceptable than the crying which Tommy often demonstrated when wanting something. Under this program, riding on the therapist's back was made contingent upon hand clapping. After this behavior was established, the rest of the ward staff was instructed to make all of Tommy's other need fulfillments contingent on hand clapping.

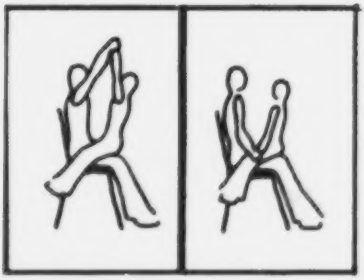
Step 13 (12th-14th week)

During the twelfth week, another attempt at speech training was made. Certain play activities inspired the following approach:

Phase A (2 days). The therapist had Tommy sit on his knees, facing him, and held Tommy's hands in a spread out fashion:

preparing for speech training

Then the therapist began breathing in and out loudly in a slow and deep manner, lifting Tommy's arms rhythmically as follows:



breathing in—
arms lifted up

breathing out—
arms pulled down to sides

Phase B (1 day). Filling his lungs with air, the therapist modeled a "holding breath" behavior—opening mouth with breath held in, arms stretched out above head, and remaining immobile for a short while. Tommy began imitating, and the time in which he held his breath became progressively longer—up to approximately 5 seconds. Then the air was released.

Phase C (4 days). When air was expelled from the lungs after the "holding breath" exercise, a cough-like guttural release sound was emitted caused by the quick rush of air through the open mouth. This sound was magnified through the following technique: During the moment when the breath was being held, the therapist quickly encircled Tommy's chest with his arms and squeezed the chest cavity. A moment later he relaxed the grip, thereby eliciting the guttural release sound. The therapist also imitated the sound at the same time. This was the first time that Tommy's sound emittances had been subjected to a control and could be elicited through the use of an exercise, i.e., on command. Tommy seemed to enjoy the breathing exercise and was reinforced by much physical contact, which included Tommy's placing his head on therapist's chest after making the release sound. In addition, the sound emittance was reinforced by a sip of milk. After this sound became more and more frequent—about 3 utterances per minute—phase D was entered.

Phase D (3 days) The therapist began to diminish his prompting techniques (fading out process) and Tommy was more and more encouraged to make this sound without the therapist's help. By use of reinforcement (food and physical contact) it was possible to gradually increase the magnitude of the sound response. The technique of rhythmical breathing exercises was decreased and only used to motivate and support Tommy if he was unable to produce the sound on his own.

Phase E (3 days) The guttural cough sound was then gradually shaped through successive approximation techniques into the vowel "ah" sound. The sequence progressed from the undifferentiated cough sound to a series of grunting, groaning and moaning sounds (which cannot be phonetically isolated for exact description), to the final vowel "ah" sound.

Phase F (2 days) A variation of the rhythmic breathing exercise was introduced. The therapist would release his breath slowly making an "ah" sound, while at the same time taking Tommy's hands in his own and beating them against the therapist's chest cavity. This created what is known among children as a type of "Tarzan" call. After several modeling performances, the therapist reversed the procedure, this time tapping on Tommy's chest in a provocative manner, encouraging imitation through prompting. Tommy picked up this exercise quickly and seemed to enjoy it very much. Food reinforcement was unnecessary and was therefore discontinued, since the activity seemed to be intrinsically reinforcing. Tommy soon took over both roles, that of tapping the therapist's chest as well as his own. He often carried on the activity beyond the exercise time. It became so enjoyable for him that the therapist was able to use it as a reinforcer for other activities. For instance, at the end of a completed task, the therapist would look at Tommy, tapping his chest and would be greeted with immediate imitation responses from Tommy.

Phase G (2 days) The therapist modeled the word "mama" while holding Tommy's fingers to his (therapist's) lips, so that the child could feel the movements of the lips. The consonant "m" was chosen because of its facility in this type of touch teaching. Within one session, Tommy had correctly added the "m" sound to the previously established "ah" sound and produced his

first word: "mama." It took 17 days from the beginning of speech training Phase II to Tommy's first word.

Phase H (6 weeks) New words from Tommy's immediate environment were gradually introduced. A typical work session during this time of the therapy consisted of the following routines:

1. Session began with hugging, fondling, and carrying about while therapist said "mama," "papa," "baby," etc., with Tommy repeating. This would last about 10 minutes.
2. The next 45 minutes would consist of work on numbers.
3. Next there was a break for 20 to 30 minutes during which speech exercises were carried out. For instance, the new word "flower" was learned by picking a flower, and imitating therapist's pronunciation. Peabody cards with pictures of previously learned words would be shown and repeated, thus practicing the whole repertoire.
4. The next 45 minutes would consist of writing exercises, during which the new word was written.
5. The session was ended with a repetition of the speech exercises described above for about 5 to 10 minutes.
6. Playtime lasted for about 40 minutes.

The work-play ratio had now been increased to 80:20 or 140 minutes work to 40 minutes of play. This was the ratio kept for the remainder of the therapy program. Social reinforcement was the reinforcer most frequently used at this stage, and Tommy showed obvious disinterest in food reinforcement. Another reinforcer which had been introduced was "being spun on a revolving chair;" this was used particularly during the speech training phase to reinforce successful imitation of a word.

Step 14 (15th-22nd week)

After about 15 weeks of therapy, Tommy was believed to be ready for further development of his social skills. Tommy was observed in his free time on the ward and a record was kept of the children who were most often in his close proximity. One of these children was then picked out according to temperament, aggressive behavior, tolerance level, and social skills.

This child (a small girl suffering from a neurotic condition, and who was partially nonverbal) was then invited to participate in the play session with Tommy and the therapist. The process of involving the other child was carried out using successive approximation rules; gradually the attempt was made to develop games and communication triads, among the three people.

Step 15 (last 6 weeks)

This last step consisted of improving Tommy's ability to function outside of ward environment. Whenever Tommy was taken from the ward to another part of the hospital, e.g., for testing, he reacted with anxiety behavior such as crying, refusing to go out the door, lying down, or trying to pull the accompanying person back to the ward. Therefore, a systematic desensitization program was designed, starting 6 weeks before dismissal. After every session Tommy was taken—at first carried—by the therapist outside of the ward for increasingly longer periods of time. Finally, Tommy was taken outdoors and some entire play sessions and speech sessions were done outside of the hospital in a nearby park.

GRADUAL WITHDRAWAL OUT OF RELATIONSHIP—EMOTIONAL WEANING

In this step, which took place the last 3 weeks of therapy, the therapist tried to reduce gradually the intensity of the emotional relationship between himself and the child, and encouraged the generalization of the child's affection to other people. The following program was developed:

1. The parents were now allowed to visit Tommy regularly and later take him out on a walk for a few hours, an afternoon, and eventually for a weekend.
2. The therapist gradually saw Tommy less frequently, first by shortening the sessions, then by skipping a day's session, and then coming only every other day. In the last week, the therapist saw Tommy only twice for a brief time.
3. The ward personnel were asked to use the accustomed teaching and therapy materials to work and play with Tommy on the ward. One young ward aide

was designated to play "horse and rider" with Tommy every morning on the play deck.

After having received 22 weeks of therapy, Tommy was dismissed from the hospital to his parent's home.

SUMMARY OF TREATMENT

Over a period of 22 weeks, the child underwent approximately 500 hours of therapy. The training was carried out in the following steps:

1. *Establishment and development of relationship and readiness training for therapy program*
   - Step 1: Establishment of initial relationship
   - Step 2: Establishment of play and pleasure activities
   - Step 3: Establishment of close physical contact
   - Step 4: Eye and movement coordination exercises and body image exercises.
2. *Establishment of behavior modification program and training in specific academic and nonacademic skills*
   - Step 1: Establishment of working habits and introduction of reinforcer
   - Step 2: Introduction of first academic task and beginning of reinforcer contingency on certain activities
   - Step 3: Introduction of first cognitive concept
   - Step 4: Self dressing training
   - Step 5: Eating habits trained
   - Step 6: Fine motor coordination training and eye-hand coordination exercises
   - Step 7: Introduction of number writing
   - Step 8: Speech training Phase I
   - Step 9: Toilet training
   - Step 10: Introduction of letters and writing exercises
   - Step 11: Number concept training
   - Step 12: Establishment of preverbal communication system
   - Step 13: Speech training Phase II
   - Step 14: Improvement of social skills
   - Step 15: Improvement in functioning outside ward environment
3. *Gradual withdrawal out of relationship—emotional weaning*

RESULTS

This chapter reports the most significant results of the therapy program. For the sake of convenience, the results are ordered in the same way as the "Procedure" section. Where steps have been omitted, they are considered minor steps toward larger goals.

ESTABLISHMENT OF RELATIONSHIP

Steps 1 to 3

After an initial slow phase of development, with very little communication, the emotional and affective relationship was established through which messages could be exchanged and behavior controlled. This subtle means of communication was not always apparent to outsiders at the beginning of the therapy, but later on became overtly visible as a flow of affection between both parties. The behavior consequences for Tommy could be easily observed, especially in contrast to "neutral" people, whom Tommy still tended to ignore before the generalization program was effected. Observable behaviors included Tommy's reaching out for therapist versus total ignorance of any other person, his eye contact with therapist versus no eye contact with others, and his physical contact with therapist versus avoidance of such with others. This affectional relationship was considered as the foundation upon which all other steps of the therapy training in the areas of social and academic skills were based.

Step 4

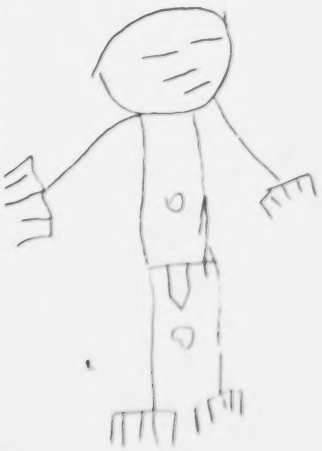
At the beginning of the body image exercise program, Tommy showed high anxiety behaviors when confronted with the therapist's or his own body parts. Slowly, a progressively increasing tolerance for these kinds of activities was established until finally Tommy came to consider them as an enjoyable game. While at the

beginning he refused to look at his hands, legs, etc., he later became extremely curious about these parts and would touch, move, and look at them. Once when the therapist showed him the lines on his hands, Tommy not only traced them with his fingers, but outlined them with a ball point pen as well. He performed and responded correctly to the following requests: Touch your hair, head, nose, eyes, mouth, ear, neck, belly, feet, toes; show your tongue and blow bubbles. While in the beginning absolutely *no* eye contact could be established, Tommy gradually started to look more often in people's faces and eyes, and at a later period some staff members reported that at times Tommy would try to "stare them down."

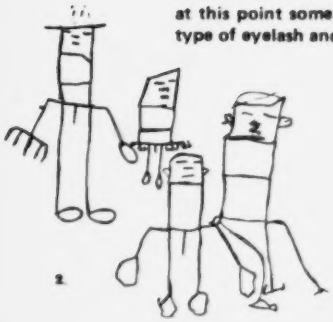
Tommy's attitude changes toward the human body and particularly faces were reflected in his increasing eye contact, and a good index of these changes is the pictures he drew during this period. He had never been observed drawing pictures of the human body at all before the beginning of therapy. The pictures appear in chronological order with intervals of several weeks.

this was the first witnessed picture ever drawn by Tommy with the exception of the black boxes which he drew compulsively for hours on end (see picture series V, page 39).

the picture was drawn right after a water bowl mirroring session . . . . the facial parts are represented by mere lines, all fingers and toes are accounted for, the body is proportioned and, quite unexpectedly, an oversized penis is added to the figure.



at this point some of the people have ears, a few have round hands and a type of eyelash and three figures are represented with a penis.



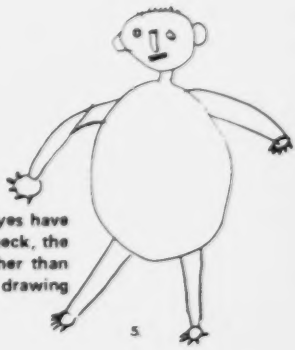
2.

one face is equipped with two eyes, two ears, and a nose, and one other face has one eye.

3.

4.

the face has progressed to the point where it has ears, eyes, nose, mouth and hair on the head . . . . other parts of the body have lost significance.



5.

the face is now the most elaborate part of the physiogonomy—eyes have *pupils*, ears, nose, mouth with teeth, hair . . . . the body has a neck, the hands and feet have fingers and toes, and the body is round rather than square . . . . this picture Tommy copied, using another child's drawing as a model.

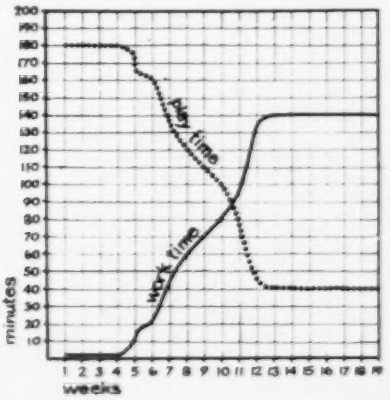
Tommy's hyperactivity also decreased very much, becoming almost nonexistent during the therapy sessions. He still, however, often exhibited a milder form of hyperactivity on the ward or when upset.

BEHAVIOR MODIFICATION TRAINING PROGRAM

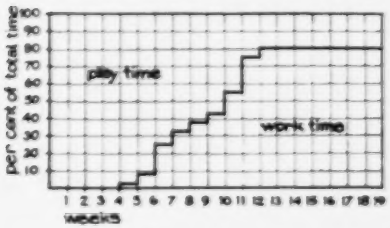
Step 1

The establishment of work habits was difficult for Tommy's tolerance towards outside interference and his cooperation on academic tasks was very low. The steady improvement made in this area is represented by two graphs. They both show the increase in the work-play ratio, with one depicting this increase in terms of minutes and the other as a percentage increase.

DEVELOPMENT OF WORKING HABITS I



DEVELOPMENT OF WORKING HABITS II



Step 4

After 3 weeks of self dressing training, Tommy was able to dress himself completely except for tying his shoes. When he was awakened in the morning, he would dress himself without encouragement and come out of his room to ask for assistance in tying his shoes. Tommy never did learn to completely tie his shoes, although he made the first knot.

Step 5

Within 2 weeks of treating, Tommy's eating habits had improved greatly. He learned to use the eating utensils correctly, but still would not cut his meat. His table manners had progressed to the point where he would wait until served, would not grab from other plates, etc. He still, however, remained very selective in his choice of food.

Step 6

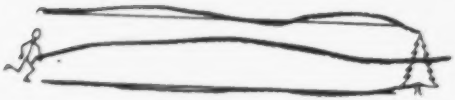
In the picture series (Set II pages) set Tommy's steady progress in fine motor coordination abilities can be seen. By comparing the 10 pictures, one can observe how much more skilled Tommy handled the pencil—for instance, picture 1 as compared to picture 8. In picture 10, his skill has improved to such a degree that one has difficulty in identifying the line drawn by Tommy because of its great accuracy. Tommy found it particularly difficult to make the distinction between a round and an angular movement, e.g., to draw a circle or a sharp corner according to what was required by the materials. Pictures 4 and 5 show these difficulties—pictures 7, 8, and 9 show the great improvement.

Step 7

Picture series set III shows Tommy's progress with writing numbers. By the end of therapy, he could write the numbers from 1 through 10 and understood the number concept, i.e., he was able to execute simple arithmetic problems such as 1+1, 1+2, 3+1. Picture IIIa represents Tommy's first written numbers and also depicts an interesting finding of the numbers program. Although Tommy quickly learned to write the number 1, he would often make additions or modifications to

1.

2.



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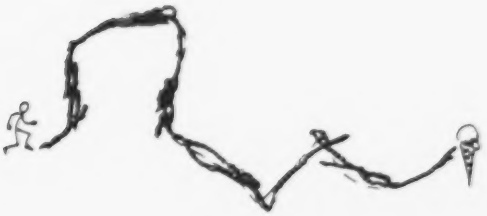


4.

5.

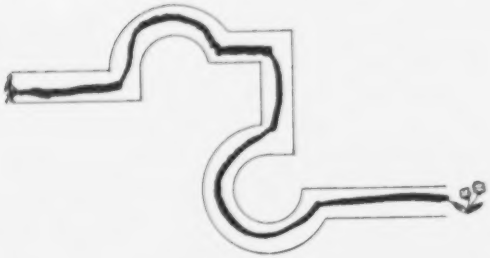
Set II

6.

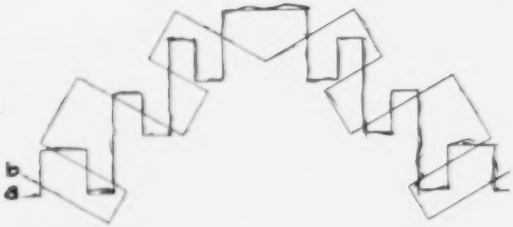
7.

8.

9.

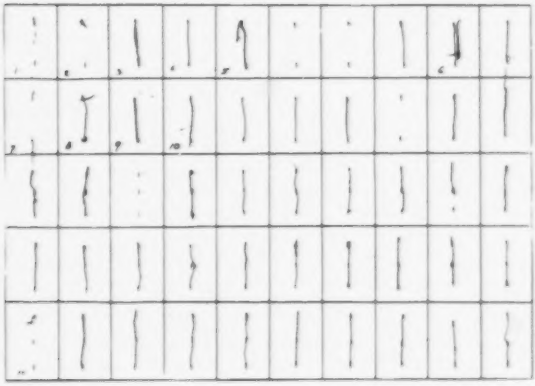


10.

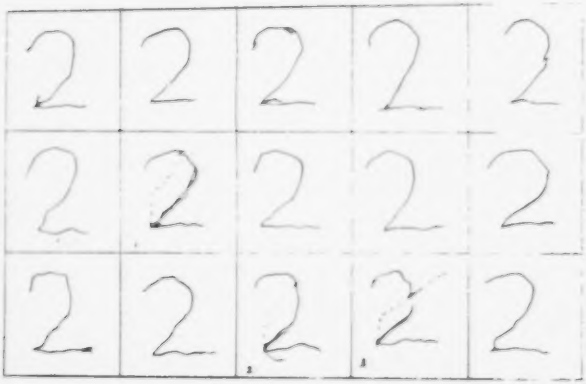


Set II

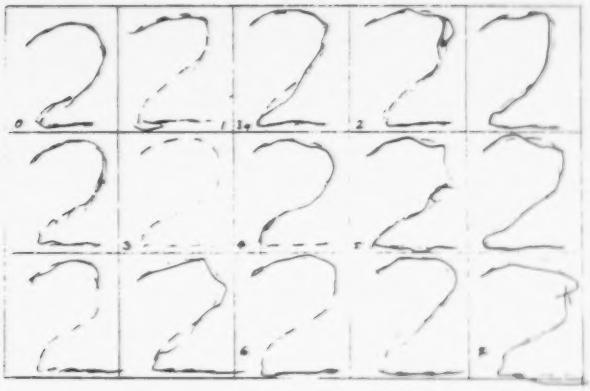
the number (see examples No. 5, 6, 8, and 10). The same phenomenon can be seen in picture series set IIIb, pictures Nos. 1 through 11, and picture series set IIId, pictures No. 1, 2, 5, and 7. The conclusion was drawn after close observation, that although Tommy could correctly write the numbers according to the model as demonstrated on the other pictures of Set IIIb, he would only tolerate a certain amount of influence from the model or the therapist, and seemed to maintain a level of independence by modifying the numbers or adding his own "signature." This seemed to be important in keeping his anxiety level down and exemplified the interweaving of his emotional condition with the learning content.

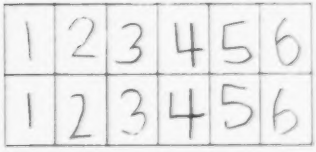


Set IIIa



Set IIIb





Step 8

The speech training Phase I was discontinued because the therapist was not able to increase Tommy's sound output to the extent necessary to begin speech training. In addition, Tommy would purposely not emit a sound for hours if asked to do so by the therapist, and eye contact decreased rapidly. Due to these reasons, the training was stopped.

Step 9

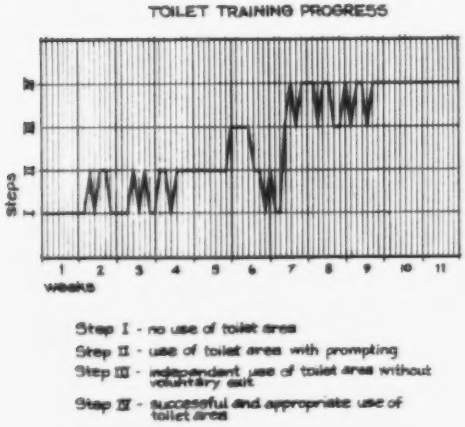
After 2½ months training, Tommy was toilet trained and performed all seven steps mentioned in Chapter 2 without prompting. The graph shows his progress during the therapy. The vertical axis on this figure is divided into the following four procedural steps:

Step I. urinating and defecating outside of toilet area

Step II. Steps 1-7 in training program performed upon command

Step III. Steps 1-6 in training program performed independently

Step IV. Steps 1-7 in training program performed independently



It is interesting to note that Tommy had great difficulty in independently leaving the bathroom, even when he could complete steps 1-6 by himself. He would often wait until called before leaving the bathroom. It was not clear to the therapist why this presented a problem.

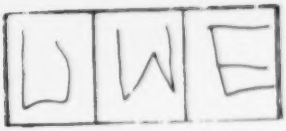
Step 10

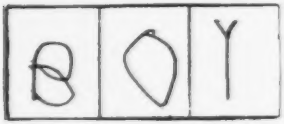
During the period of therapy, Tommy learned to read and write about 20 words, in sentences like "This is a . . . ." Picture series set IV lists the words he was able to read and write. In the beginning, training was limited to rote copying, and later he could read and write sentences like "This is Mama" without having a model shown. Sometimes the therapist would show Tommy a picture card (for example, a fork) and Tommy would then write "This is a fork."

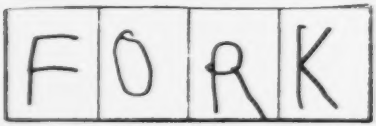
Step 11

See the results of step 7.

Set IVa







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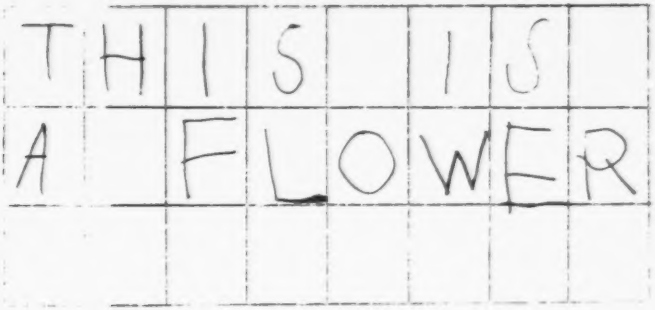

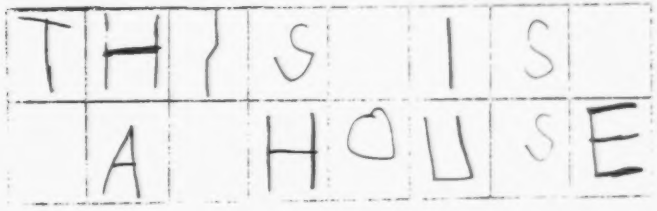

THIS IS
GRASS

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Step 12

Tommy quickly learned to clap his hands appropriately if he wanted something. He then learned to generalize this behavior to the other staff and children, which made communication between these parties possible. Thus, not only was Tommy able to make his wishes known, but these preverbal communications led to increased interaction between Tommy and his environment.

Step 13

In speech training Phase II, Tommy learned to speak about 70 words in a period of 8 weeks. He was able to go to a nurse and say "tie shoe" or "milk." He was not, however, able to speak in complete sentences—something that was not expected in such a short period of time. Tommy exhibited difficulty in forming sounds, probably stemming from the fact that for over 6 years the speech organs had not been trained. Sounds like the English "r," "the," and guttural sounds in general caused Tommy the most difficulty, but he improved rapidly and was able to hear a word once and repeat it almost correctly. It should also be noted that Tommy often repeated learned words in a monotone, in an "empty" and inappropriate way, as if jabbering to himself. For long periods of time he would repeat the same word over and over in a babbling way and his speech sounded sometimes echolalic.

Step 14

Tommy improved his social skills significantly and began involving other people in his life besides the therapist. He was noted to be more friendly towards other people and talked to and held eye contact with them. The nurse's discharge notes report:

> In the past five months we have seen Tommy make tremendous gains in his ability to interact with people, but they have developed slowly and gradually in sometimes extremely subtle ways. He knows the staff that have spent a great deal of time with him and seeks them out for walks, piggyback rides, tickling, etc. He is very observant of those staff, and at times seems jealous if they are playing with other

> children, and shows his need for attention by dropping chairs and tables and whines (sic) . . . . In the beginning he had fleeting eye contact. He has no peer interaction but he does observe, copy and mimic them. The one exception is a 12 year old female peer who seeks him out and plays with him like the staff do. He was placed in a multiple room in hopes of developing peer relations but only fought with them when they took his possessions. He is able to show warmth in small ways, e.g., when asked for a hug or kiss sticks cheek out to be kissed and smiles pleasantly when doing this and a few times has given potato chips (his favorite food) to staff when asked.

Tommy's parents also reported a great increase in affection shown them by Tommy and his mother reported that his facial expressions had changed from a constant closed and worried look to an open and often happy countenance. Tommy often exhibited amusement and laughed, and his anxious crying behavior decreased drastically. The earlier noted self stimulatory behavior of spinning himself around and rocking his head stopped entirely, although he still enjoyed spinning small objects. It is interesting that Tommy began masturbating during therapy and for one 4 week period masturbated in a very pronounced manner before decreasing this behavior again. It was also reported that Tommy had twice in succession tried to touch a nurse under her skirt.

Step 15

In picture series set V the change in the relationship between Tommy and his environment can be seen. Before the therapy began, his only known drawings were like picture 1—square, compulsive geometrical designs. At the end of therapy he was drawing a watch (picture 2), a car (picture 3), a flower (picture 4), and house (picture 5). (Most of these pictures are copied from other pictures or real models.) This indicates a changed awareness of reality and the world around him. Gradually Tommy tolerated being taken outside of the hospital and on many walks through the park would pick flowers, leaves, and grass, name them and play with them awhile. He also investigated new objects, like a bicycle, touching, sitting on it, or otherwise attempting

Set X

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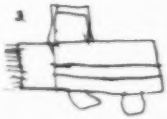

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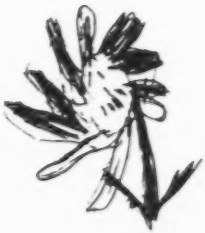
5.



Set X

to get acquainted with the object. He was no longer afraid of discovering new phenomena in his world.

GRADUAL WITHDRAWAL OUT OF RELATIONSHIP

The emotional weaning took place gradually and without observable problems for Tommy. He gave up waiting for the therapist at the door after a couple days of his absence and the nurses did not report any significant behavior change at that time. Tommy responded well to his parents, who were visibly touched by the affection he showed for them.

SUMMARY OF RESULTS

During the therapy program Tommy progressed in each of the target areas of concentration. He learned to speak about 70 words, became toilet trained, dressed himself, and ate his food using utensils, displaying acceptable table manners. He also learned to read and write the numbers from 1 to 10, solved simple arithmetic problems, and could read and write about 20 words in complete sentences. His social skills improved vastly; he changed from a chronically unhappy child to one who could enjoy many things and participate with others in a pleasant way. His self stimulatory behavior disappeared and his autistic self isolation need decreased to a minimum. One of the most important outcomes was the development of a longer attention span, which not only contributed to his academic successes, but also led to a more normal interaction with other people and his environment in general. For the first time in his life, Tommy was able, without great anxiety, to accept the realities of the outside world and to begin occupying himself with its many discoveries. He had learned to give warmth and sympathy to others which opened a new realm of personal interaction and affection.

DISCUSSION

One of the first questions that one might raise in connection with this case study is whether Tommy can be regarded as a genuine case of childhood autism. His symptoms, as described in Chapter 1, coincide to a high degree with the diagnostic signs established by Kanner (1943), indicating that he was indeed suffering from this rare condition. On the other hand, Tommy's history takes exception to one of the diagnostic indicators described by Rimland (1964). While Rimland stated that the "normal" autistic condition is apparent from the moment of birth, Tommy did not show any disturbances or unusual behavior before age 2, as reported by the relatively reliable source, his mother. On the contrary, the mother insists that Tommy developed very well until he was 2 years old. With this exception, Tommy's symptoms also overlap with Rimland's diagnostic indicators. Bender (1955, 1956) offered an answer to this diagnostic problem by suggesting the possibility that the autistic child may be disturbed from birth or may regress after a normal developmental period. In light of the controversy over the definition of autism, the question cannot be answered with complete certainty.

The most conspicuous limitation of the study was that of time, under which the therapy suffered in general. The budget available for the treatment was limited to 5 months, which forced termination of the therapy although further treatment was necessary. The fact that Tommy, in several months' time, made up skills which usually require years to develop, e.g. speech skills, raises the following questions: (a) Was the pace of the therapy too fast? and (b) Was not enough time allowed, therefore, for a slower but in depth development to take place within the child?

After more than 6 years of total unproductivity in some of the most relevant areas such as speech and

social skills, and a highly reduced rate of development in other areas, it is questionable whether the skills which were quickly "caught up" are qualitatively equivalent to those which are allowed to develop slowly and naturally. Some psychologists, especially those with a psychoanalytic orientation (Spitz, 1965; Erikson, 1950), strongly doubt the possibility of qualitatively "catching up" in children as old as Tommy, especially in social areas. In general, however, it appears that Tommy did very well in catching up, and had it not been for the time pressure under which the therapist was forced to work, it is believed that the end results would have been better. The author strongly supports the idea that another 2 years of treatment could have effected many more positive results.

This does not mean that the child would be what is understood as a "normal" child. It would be inappropriate to make such a prediction, and in the author's opinion, it is not especially relevant to try to change an autistic child into a so called "normal" child. The only relevant goal in therapy is to optimally develop whatever the child has towards the goal of self actualization. In Tommy's case, the extension of the therapy over another 2 years would have contributed to this goal. As stated before, however, the therapist in this case had no influence nor possibility to extend the therapy beyond the prescribed 5½ months, and indeed in the beginning had to fight for each additional week the child was allowed to stay in the hospital.

The failure of speech training Phase,I can be partially understood in light of the mentioned time pressure. The basic "rule" of the therapist was not to impose something on the child against his will and before he was ready for the particular goal. Yet the child proved not to be emotionally ready for speech training Phase I, as witnessed by his intense anxiety and refusal to cooperate. Tommy was still very intent on shutting out the potential sources of sensory perception and particularly those which demanded an affective response—which can be regarded as a sound produced by him. Tommy did not yet feel safe enough to cope with the demands made on him.

It is the author's belief that behavior modification can prove to be a powerful tool in therapy if the child is basically ready for such treatment. Essential to the

success of the behavior modification treatment are the patient's willingness to be treated and the therapist's recognition of the limitations of operant conditioning methods—particularly when applied to human subjects as opposed to Skinner's pigeons. By waiting until this consent is given, failures like speech Phase I can be eliminated, and as speech training Phase II shows, behavior modification used at the correct time can prove to be a very useful tool in achieving difficult goals.

Another possible reason for the failure of the first speech training phase is the absence of an emotional component. The technique was based on a Skinnerian model of a relatively cold and emotionless machine behavior modification program and, as previously mentioned, this did not work with Tommy. In devising the technique for speech training Phase II, the therapist added an emotional component to the modification "machine"—a warm and mother-child like emotionally satisfying element expressed through the increased body contact in the breathing exercises and the constant fondling. Only then did the speech work begin to be successful. It may be that in order to solve emotional problems, particularly those of deprived affective needs, an emotional and affective foundation is required, upon which the mechanical tools such as operant conditioning can be established.

The emotional aspects of being taught and of learning include being able to share, to accept guidance, and to tolerate being led by an influence outside of oneself. The previously mentioned "modified" letters and numbers attest to Tommy's anxiety in connection with these emotional elements of learning, as he attempted to maintain a certain amount of independence from the outside influences of therapist and materials. This behavior seemed to be Tommy's way of dealing with his anxiety, and the therapist purposely did not interfere with it. The modifications of the letters and numbers gradually disappeared when Tommy did not need this crutch any longer. The therapist also attempted not to make Tommy aware of mistakes at a time when he could not tolerate such interference. With this in mind, the program was designed to eliminate the probability of mistakes as far as possible. The tasks were designed to demand from the patient only what he was able to

give—gradually leading to higher performance. An example of noninterference in the child's demonstrations of independence is as follows: At a later point in therapy, when Tommy's tolerance for criticism and correction had been increased, he would sometimes write incorrect letters (with an obvious smile) as a type of "game" to test the therapist's limit. Tommy was given the sole control over the eraser and the therapist would then warmly request that Tommy give him the eraser. Amid giggling and laughter, Tommy would finally hand him the eraser, which authorized the therapist to erase the incorrect response, whereupon Tommy would quickly write the correct answer in the empty space.

The model which the therapist had in mind while designing the academic program was a type of Skinnerian teaching machine. This model, however, proved to be difficult, if not impossible, to follow for many of the therapy steps. In addition, as previously suggested, it did not supply the emotional component which was found necessary to accomplish many of the goals. Further research and studies are needed to create a teaching program for psychotic and borderline psychotic children in general.

In Chapter 3 it was noted that Tommy's newly developed speech, particularly his jabbering behavior, could be described as "empty" or "echolalic." The use of these terms, however, must be qualified. It must be kept in mind that this was Tommy's first speech experience since he was a baby. It is a common phenomenon that children, when acquiring speech, go through a phase of babbling to themselves and experimenting with language and speech organs. The therapist himself often imitated Tommy's sounds in order to stimulate him, much like mothers do with their babies. Thus, Tommy's jabbering might very well have been a phase of experimenting and enjoying the new skill and should not be confused with an end result of his speech development. Only at a later point of the development could it be determined if his speech is indeed echolalic—and this was not possible within the time limitation of the therapy.

An interesting result of the therapy was the way in which Tommy's hyperactivity decreased with the pro-

gressing treatment. A possible explanation is offered by Deutsch and Krauss (1965): "A hyperactive person is seen as not having a conception of how to reduce a tension and therefore perceives no goal region. He will therefore let his behavior be determined by his desire to leave his present negative region for another, and to leave that one for another, and so on [p. 39]." When the therapist offered himself as a goal for need gratification and opened new ways of socially acceptable and enjoyable occupations with new skills and games (playing, interaction with people and environment), the hyperactivity decreased significantly and ultimately disappeared in the therapy sessions. It only sporadically reappeared on the ward when the new source of satisfaction, i.e., the therapist, was no longer present. Once Tommy generalized some of this satisfying relationship to other people on the ward, his hyperactive behavior became less frequent there as well.

In dealing with the self stimulatory behaviors of Tommy, particularly the tendency to spin himself continuously in circles, the author believes that the introduction of the revolving office chair as a socially appropriate "self spinning" reinforcer contributed significantly to the decrease in Tommy's self stimulation. Also contributing to this decrease was the introduction of physical games and plays, like fondling, cuddling, or horse and rider, which were incompatible to the spinning activity and accounted for most of the therapy session in the beginning period.

One other limitation of this study was the inability of the therapist to involve the parents in the treatment. Various circumstances made such efforts too complicated to pursue.

Whitehorn (1958) has pointed out that improvement in schizophrenic patients is most likely to occur in cases where the therapist has gained

> . . . grasp of the personal meaning and motivation of the patient's behavior, going beyond description and narrative biography . . . . The problem of establishing effective communication with schizophrenic patients is notoriously difficult as well as strategically crucial [p. 272].

He furthermore noted that communication depends not only upon the proper emissions and correct recep-

tion of verbal messages, but also upon a kind of *emotional communion* which relays message connotation.

Whitehorn's observations have a great relevance to the objectives of Tommy's case study, which was an attempt to interact with an autistic child on an emotional and affective basis in order to create a foundation for a modified behavior modification training program. Through this technique, the possibility was opened for Tommy to experience social life and to rely upon others with trust. The basis for the development of trust is a warm and supportive relationship that is consistent and predictable—for only then can the autistic child relax his defenses and begin to relate freely to others. When this occurs, academic education and training towards skill attainment can also take place. There are, however, many unanswered questions concerning the "how" of treating and educating autistic children, and more research is needed before these problems can be solved.

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